

NOTES ON AUSTRALIAN POLYPLACOPHORA, WITH
DESCRIPTIONS OF THREE NEW SPECIES AND
TWO NEW VARIETIES.

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PLATE III.

Genus ACANTHOCHITON (Gray, 1821, em.).

In our paper of October, 1898 (Trans. Roy. Soc. S. Austr.), and subsequent papers, Dr. Torr and the writer followed Dr. Pilsbry in adopting the name for this genus of *Acanthochites*, Risso, 1826.

In Proc. Mal. Soc., vol. xi., pt. ii., pp. 126 and 127, June, 1914, Mr. Tom Iredale draws attention to the fact that E. Gray's name of *Acanthochitona* (Lon. Med. Repos., vol. xv., 1821) antedates Risso's name by five years, and he therein also points out that in the name commonly used, Risso's spelling has been amended. Iredale followed this in July, 1915 (Trans. N. Z'd Inst., vol. xlvii., p. 422, 1914), by amending Gray's name in dropping the terminal "a" and writing the genus "*Acanthochiton* (Gray, 1821, em.)". It will also be seen that Dr. Pilsbry, *l.c.*, while adhering to Risso's name, gives "*Acanthochiton*, Herrmannsen, *Indicis Generum Malacozoorum Primordia*, i., p. 2; *Acanthochiton* of Carpenter and many modern authors." While several Australian workers have adopted Gray's name in place of Risso's, as pointed out by Iredale, *l.c.*, it is regrettable that they have not followed Iredale in the amended spelling, changing *Acanthochitona* into *Acanthochiton*.

In all my papers, in 1918 and since, I have adopted Iredale's spelling for the following reasons:—(1) The terminal "*Chiton*" is in keeping with so many other genera. (2) The two words, "*Acantho*" and "*Chiton*," are both masculine, and Gray seems to have tacked on to these two Greek words a Latin feminine terminal, thereby producing what my friend the classical professor terms, a "mongrel word." It is possible that Gray added the "a" to make his new genus agree with a certain specific name, a course that can hardly be justified; anyhow, I cannot see how we can do otherwise than adopt Iredale's suggestion and drop the unfortunate terminal. This course seems to be the commonsense one, and is probably the only correct one, and, as Iredale says, there are plenty of precedents.

ACANTHOCHITON (NOTOPLAX) GABRIELI, n. sp.

Differs from *A. costatus*, Ad. and Ang., in having deep, broken, longitudinal grooving in the dorsal area, whereas *A. costatus* has smooth, except for the transverse ribs following the lines of growth.

The pustules in the diagonal ribs of the species under description are larger, more rounded, and irregular than in *costatus*, and in addition on some of the valves there are evidences of a second coarsely pustulose rib on the posterior margin of the median valves, in this respect approaching its Western Australian ally, *A. sub-viridis*, Torr.

Remarks.—The specimen described above has been kindly lent to me for description in this paper by my friend Mr. Gatliff; it is from Caloundra, in Queensland, and the type, which has not been disarticulated, remains in Mr. Gatliff's collection. I am naming it after my friend Mr. Charles J. Gabriel, who has for so long been associated with Mr. Gatliff in the excellent conchological papers they have jointly produced. While I suspect this form should hold sub-specific rank only, it is as much entitled to the higher rank as are some of its allies referred to in the discussion following.

ACANTHOCHITON COSTATUS, Ad. and Ang., and its allies.

(Ad. and Ang., P.Z.S., 1864, p. 194; Angas, *l.c.*, 1867, p. 224.)

The examination of the preceding species from Caloundra and, subsequently, the loan of a specimen from Port Philip, Victoria, measuring $7\frac{1}{2}$ mm. in length, by Mr. Gabriel, has made it necessary to go into the whole question of the respective relationships of several nearly-related species.

My series of *A. costatus* include three from Sydney, 6, 12, and 19 mm., respectively; several from Tasmania, up to 36 mm. in length; and one from South Australia, 21 mm. All have minute, slender, girdle spicules, easily detached; all have several ribs composed of coarse pustules, behind the mucro, in tail valve, but in the smallest this feature is represented only by a single large pustule at the outer edge; all probably, in the quite juvenile stage, possess none of these posterior ribs. In the larger specimens the original form of the dorsal area in the juvenile is not quite clear, but in the three from Sydney Harbour, 6, 12, and 19 mm. respectively (dry), it certainly commences with a prominent, broad, rounded beak, the area rapidly widening with sundry jags at each side, giving the pinnatifid character. On reaching a total length of the whole shell of 6 to 10 mm., the dorsal area may slightly contract or continue in two parallel lines, forming in the adult a narrow raised dorsal ridge. On collecting the

small specimen at the Quarantine Station, Sydney, in 1918, I at first thought it a different species owing to its wide diverging dorsal area, but at last noted that it was only a juvenile character.

Mr. Gabriel's small shell from Port Philip, about $7\frac{1}{2}$ mm., which I understand has been recorded as *A. rubrostratus*, Torr, is similar to the juvenile *costatus* in having small spicules clothing the girdle and in having the broad dorsal area of the juvenile, but it differs in not having coarse pustulose ribbing behind the mucro and in the pustules of the diagonal ribs being small; in these two respects only does it resemble *rubrostratus* and *speciosus*. I believe that had it attained a larger growth it would have been quite similar to typical *costatus* in these respects. It may be that in Victoria a race of *costatus* is living that attains the senile characters at a later age than is common to that species.

Throughout this paper all measurements given are of dry specimens. I have two specimens collected by myself in Gulf St. Vincent, measuring 8 and 18 mm. long, and I have compared them with Dr. Torr's type and co-type of *A. rubrostratus*, and find them con-specific; the girdle is covered with coarse white spicules, similar in size to those clothing the girdle of *A. speciosus*, H. Adams, but appear less irregular in their attachments and show between the valves in a much less degree; the dorsal area is similar in the two, except that the pinnatifid character is more continuous in *rubrostratus*; neither have ribs behind the mucro, although one of Dr. Torr's latter shows three waves or undulations corresponding with the posterior ribbing of *costatus*, nor have either the coarse pustules of that species in the diagonal ribs. The width of the girdle of *rubrostratus* is less than that of *speciosus*, and the beak of *speciosus* is less pronounced, but when it is considered that the whole of our specimens of *rubrostratus* are smaller than the smallest of our specimens of the other species, is it not possible that the slight differences enumerated may be due to the juvenility, and that *rubrostratus* is really the young of *A. speciosus*.

In conclusion.—As before mentioned, I have been much indebted to Dr. Torr for the opportunity of examining specimens in his collection, but until a much larger series of all the species, in all stages of growth, is available, I do not like to make a final decision, but I am inclined to think that ultimately we shall be able to recognize *A. costatus* as the dominant species, with two sub-species—*gabrielii*, Ashby, from Queensland, and *sub-viridis*, Torr, from Western Australia—*A. costatus*, sub-species, being found in New South Wales, Victoria, Tasmania, and South Australia; *A. speciosus*,

H. Adams, as a dominant species with *rubrostratus*, Torr, either as a sub-species or as a synonym, being the name distinguishing the juvenile form.

It should be mentioned that some of the forms above referred to show sub-cutaneous lining and others short longitudinal rows of shallow holes near the beak on the dorsal area. The following *resumé* may be helpful:—

Minute, slender, girdle spicules: *gabrielii*, *costatus*, *sub-viridis*.

Coarse, girdle spicules: *speciosus*, *rubrostratus*.

Broad, pinnatifid, dorsal area in juvenile: *gabrielii* and *costatus*.

Narrow, pinnatifid, dorsal area: *speciosus*, *rubrostratus*, *sub-viridis*.

Small pustules and no ribs behind mucro: *speciosus* and *rubrostratus*.

ACANTHOCHITON MAYI, n. sp.

Introduction.—A number of median valves of a rather striking *Acanthochiton* were dredged by Mr. W. L. May in various parts of Tasmania, in depths varying from 60 fms. to 100 fms. It is such a distinct species and the valves are so well preserved that one seems well justified in describing it without waiting for the discovery of the whole shell. I have much pleasure in calling it after Mr. W. L. May, the discoverer, and a gentleman who has done such splendid work in conchology.

Specimen No. 1. Type.

Median valve.—Colour pale cream, very strongly carinated, prominently beaked, dorsal area well defined, fairly broad but sides almost parallel, *i.e.*, after attaining half-growth the sides of this area do not diverge. The central ridge and the two sides of this area continue as smooth ribs the whole length of the valve; the space between is cut up by short, deep, longitudinal grooves, reminding one of cuneiform characters. These deep grooves make the ribs, before referred to, jagged at their margins. The lateral area is separated from the pleural by a fold surmounted by extra large pustules, which are widely spaced. The first three rows next the beak are composed of minute pustules which quickly lose themselves in the lateral rib of the dorsal area, before referred to; the fourth row of pustules is composed of three minute and six large ones placed diagonally in the row which is parallel to the dorsal area, beyond the ninth pustule. In this row the sculpture is confluent, forming a broad flat rib for about one-third of the total length of the valve. The rest of the valve is decorated with five rows and one-half row of elongated, much raised,

flat pustules, widely spaced, and the rows widely separated from one another. All pustules are placed on the diagonal, and the rows themselves become more and more diagonal as the margin of the shell is approached. Slit 11 modified into a deep groove, with raised edges on the upper side of the articulum.

Measurements.—3 mm. longitudinally, 3.75 mm. laterally.

Habitat.—A number of valves dredged 7 miles east of Cape Pillar, North-west Tasmania, in 100 fms.; one valve, about the same depth off Schouten Island; one valve, coloured red, off Port Arthur, South-east Tasmania, in 60 fms.

Specimen No. 2. Co-type.

This median valve was likewise dredged in the same depth east of Cape Pillar. While corresponding, in the main, with the preceding valve, it differs in that the dorsal area is uniformly covered with short, deep, wedge-shaped, longitudinal grooves. Also the fold separating the pleural from the lateral area is very strongly raised, and the pustules in the rows, where they pass over this fold, are larger and broader than anywhere else, for a width of two pustules. If these pustules had not been so widely spaced one would have described the valve as possessing a wide diagonal rib composed of two rows of pustules. In method of sculpture and shape of the pustules the two valves described are otherwise identical.

In conclusion.—The type is being presented to the Tasmanian Museum and is figured from a drawing. The co-type is figured from a photograph taken by the writer and remains in my own collection. In a paper on Polyplacophora of Tasmania, by W. L. May and Dr. Torr (Proc. Roy. Soc. Tas., 1912, p. 35), a note is made that the valves described above were wrongly identified by Hedley and May (Rec. Austr. Mus., vol. vii., No. W, 1908) as *Acanthochiton crocodilus*, Torr and Ashby.

ACANTHOCHITON SHIRLEYI, n. sp.

Specimen No. 1. Type.

General appearance.—Broad, girdle wide, densely and coarsely spiculate, shell flat and low, the spicules of the girdle standing up above the shell.

Colour.—Some valves are dark horn-colour, others are creamy-white; the dorsal area is creamy-white in some valves.

Anterior valve.—I cannot notice any rays or undulations. The sculpture on this valve is largely eroded, but it is evidently well covered with circular pustules. Insertion plate long; slits 5, notch very short but continued on upper side in

a broad groove to the tegmentum, colour white tinged with blue. Measures $3\frac{1}{2} \times 3\frac{1}{2}$ mm.

Posterior valve.—Tegmentum very small, about two-fifths of total width of valve, anterior portion semi-circular, mucro posterior, dorsal area rather narrow, wedge-shaped, rugose; the wrinkles following the growth-lines are continued across the anterior portion of the dorsal area. The shell behind the mucro is very flat, and shows little sculpture; such as there is, is composed of shallow broken wrinkles following the growth-lines. The dorsal area and the portion behind the mucro creamy-white, side areas dark horn and sculptured with rows of irregular, flat, more or less circular pustules, following the growth-lines and, in places, especially towards the outer margin, coalescing. Insertion plate long and very broad, slit 11, sutural laminae small and produced forward with a deep inward bent between them and the wings of the insertion plates. This feature is very marked. *A. bednalli* has a somewhat similar inward fold at the slits, but this species has this fold on the opposite side of the wing of the insertion plate. Sinus broad, the semi-circular margin of the tegmentum only occupies half the width. Colour of articulation, pale bluish; the slits are continued half-way to the tegmentum in a deep, almost semi-circular groove. This valve measures, longitudinally 3 mm., laterally $4\frac{1}{2}$ mm.

Median valve.—The following is a description of valve 4:—The dorsal area is smooth except for growth-wrinkles which are continued from the side areas; this area consists of a shallow wedge-shaped depression (this feature is common to all valves except valve 2, in which this area is arched; a similar variation occurs in a second specimen described hereunder), some of the growth-wrinkles are in this area broken, suggesting an ill-defined string of granules. The lateral and pleural areas are not separated but are studded with rows of flat circular pustules, following the growth-lines. The slope of the sides below the elevated fold that margins the dorsal area is slightly curved. Inside, as well as the insertion plates and sutural laminae, pale blue, slits 11, sutural laminae produced forward, sinus narrow and rounded. This valve measures $4\frac{1}{2} \times 4\frac{1}{2}$ mm.

Girdle.—Densely covered with long, coarse, cream-coloured spicules; the fringe spicules are a little more slender; sutural tufts long, porcelain-white, and pointed.

Measurement of dried shell, 15×6 mm.

Habitat.—North-west Reef, Barrier Reef, Queensland.

Remarks.—I am indebted to Dr. John Shirley for the opportunity of examining and describing this *Acanthochiton*,

and I have much pleasure in naming it after him. The specimens submitted to me were badly encrusted and, in parts, eroded; the true characters only became visible on disarticulation and cleaning. The shape of the articulamentum both in median and tail valves, the fact that the dorsal area is usually concave, and the girdle densely spiculate, easily separates this *Acanthochiton* from any other Australian species. The type belongs to the Queensland Museum.

Specimen No. 2. Co-type.

The second specimen, which I am calling the co-type, differs from the type in that the centre of the dorsal area, in the median valves, is slightly convex, becoming flat or slightly concave before the pustulose sculpture is reached. Also the pustulose character of the sculpture is more limited in area, anteriorly the pustules, which are very flat, become sub-obsolete and confluent following the course of the growth-lines. The co-type remains in my collection.

ACANTHOCHITON RETROJECTUS, Pilsbry,

var. *pustulosus*, n. var.

(*A. retrojectus*, Pils., Naut., vii., p. 107, Jan., 1894; Proc. Acad. Nat. Sci. of Phil., 1894.)

Introduction.—In November, 1918, I collected a very long series of *A. retrojectus*, Pilsbry, in the Quarantine Station, Sydney Harbour. And early in 1919 the following notes on this somewhat difficult species were written. At first one concluded that there were at least two or three different species represented in the series collected from the one spot. Many had similar sculpture in the dorsal area to that of the other areas, but in some this area was smooth, and, again, while many had the regular, evenly-rounded, pustulose sculpture described by Dr. Pilsbry, in others a large part of the shell was ornamented with large tear-drop pustules.

On fuller investigation it was found that there was a complete series of intermediate forms. All are similar in the character and structure of the girdle, the shape and lamination and slitting of valves, the tail valve and position of mucro; throughout these features seem consistent, and the extreme divergence of sculpture does not, in my opinion, warrant the separating of them into distinct species. Nevertheless, at the suggestion of my friend, Mr. W. L. May, I propose a distinct varietal name for the form with coarse pustules, calling it var. *pustulosus*.

Girdle is densely covered with minute scales or short blunt-ended spicules, these are mottled, the white ones often

placed in rings, $\times 65$; this ring resolves itself into a string of blunt-ended scales, set in a circle. Owing to the minute nature of these scales the general appearance of the girdle, except under a high power, is spongy. The sutural tufts are white and well defined.

Dorsal area.—Broadly wedge-shaped. In typical shells it is ornamented with longitudinal rows of strongly-raised circular pustules, set bilaterally in divergent lines, thus forming a V with the apex in the centre of the area. But in different specimens these pustules vary from circular, well-raised pustules to those that are mitre-shaped, or even to long flat dashes. Again, in some specimens this area is absolutely smooth except in the margins, but this variation appears somewhat rare.

Pleural and lateral areas.—These, in typical specimens, are not distinctly differentiated and are ornamented with longitudinal rows of strongly-raised circular pustules, gradually increasing in size towards the girdle. The varient, which I suggest should be known as variety *pustulosus*, Ashby, has the first row or so of pustules from the dorsal area, more or less round, but fully half the valve is decorated with a few large tear-drop-shaped pustules, some of them being fully three or four times as long as wide. In some, the regularity of the longitudinal rows is preserved; in others, this system of sculpture is lost, these tear-drop pustules being irregularly placed, widely separated, and very raised.

Colour.—While most specimens are mottled pale green and black, there are some that are pale green throughout, and others that are uniformly rufous; in some the dorsal area only is reddish-brown, in others it is pink. When disarticulated and cleaned the shells are transparent and, usually, both tegmentum and articulamentum are green.

Habitat.—While very numerous at Port Jackson, New South Wales, it appears less common in Victoria, and I have not taken it in South Australia, where its place is taken by the allied form, *A. kimberi*, Torr. This latter I also met with in Western Australia.

Probably the Sydney shell has extended down the east coast and then turned towards the west, along the Victorian coast; the allied form, *A. kimberi*, has come in from the west and somewhat overlaps *A. retrojectus* in Victoria.

I am indebted to Messrs. Gatliff and Gabriel for the opportunity of examining a number of specimens from their respective collections.

They were from Western Port, Port Philip Head, Point Nepean, Torquay, and San Remo, all in Victoria. They show

a good deal of variation, mostly of the large pustulose variety. Some of the shells were larger than any I secured at Port Jackson, and amongst them were certainly some representatives of *A. kimberi*. Some forms of *A. retrojectus* are very difficult to separate from that species, unless the specimens are very perfect.

In conclusion.—Dr. Pilsbry, *l.c.*, founded the sub-genus *Meturoplax* for the reception of this species, chiefly on the character of the dorsal area, "dorsal area indistinctly differentiated"; while, in typical specimens, this may be true, this feature is not constant, and makes one hesitate to adopt his sub-generic name at this stage.

ACANTHOCHITON CORNUTUS, Torr and Ashby, and
A. EXILIS, Torr and Ashby.

(Trans. Roy. Soc. S. Austr., vol. xxii., pp. 217-219, Oct., 1898.)

Until last year *A. cornutus* was only known from the unique type taken by the writer at Marino, in South Australia; but on January 24, 1920, I took a second at Cape Jervis. Messrs. Gatliff and Gabriel each lent me a very fine specimen that they had identified as *A. exilis*. I noted that they were con-specific with my type of *A. cornutus*, and, later, compared them with the type of *A. exilis* which is in Dr. Torr's collection, and found that *A. exilis* is simply the juvenile form of *cornutus*. I find a note in my note-book, made a couple of years back, that these two forms were very close to one another.

The largest specimen of the series dredged by Dr. (now Sir) Joseph Verco was selected as the type of *exilis*, and was only 3 mm. long; all the specimens were much curled and somewhat bleached, whereas the type of *cornutus* was over 10 mm. long and well preserved.

There are slight differences between the two, but not more than can be attributed to immaturity; the minute curled *exilis* certainly looked very different from the fine specimen of *cornutus*, but they are undoubtedly the same species. As *cornutus* was described on an earlier page than *exilis*, it has that priority, and *A. exilis* is a synonym thereof.

In the addendum to our paper, *l.c.*, reference is made to apparent "eyes" on the dorsal area of *A. cornutus*. It is interesting to note that small black specks are visible in the shells of the three recently discovered specimens, before referred to; but I have not yet been able to determine whether they are true eyes, or some other sense organ. The determination of their true character must be left to future investigation.

ACANTHOCHITON COXI, Pilsbry.

(Naut., vii., p. 119, Feb., 1894; Proc. Acad. Nat. Sci. Phil., 1894, p. 80, pl. iii., figs. 21-26, pl. iv., fig. 34; *A. lachrymosa*, May and Torr, P. and Proc. Roy. Soc. Tas., 1912, pp. 36 and 37, pl. i., figs. 1-4.)

The identification of this *Acanthochiton* has always been a difficulty with me. In July, 1919, I wrote the Australian Museum for the loan of a specimen, and at their suggestion Mr. Bassett Hull very kindly sent me a shell which, on examination, I found could not possibly be *A. coxi*; but, strangely enough, it was a worn specimen of a species described by Dr. Torr and the writer in October, 1898, under the name of *A. crocodilus*, and which, up till the identification of Mr. Hull's specimen from New South Wales, was only known to occur in South Australia, and limited to the pair originally described, which were side by side on the same rock, at low water, at Marino.

Later on I received specimens from Dr. Torr's collection and the Queensland Museum, labelled *A. coxi*, but in both cases they were misidentifications and referable to well-known species. Through some oversight, although I again applied to the Australian Museum for the loan of their co-type, it was never sent for my inspection.

In correspondence with Professor Dr. J. Thiele, of Berlin, I mentioned my desire to see *coxi*, and he was good enough to send me a specimen from Balmoral, which I conclude is the place of that name in North Borneo. The specimen was marked "identification uncertain." If it had come from Tasmania one would have no hesitation in identifying it as a slight variant of *A. lachrymosa*, May and Torr.

It differs from the Tasmanian shells, slightly, in the arrangement of the pustules, and the spicules on the girdle are slightly coarser. On writing Mr. W. L. May he advised me that he had some years ago seen the co-type of *coxi* in the Australian Museum and had made a note that it was very close to *lachrymosa*. In October last, Mr. May brought over a very fine series of *lachrymosa* from the type locality. We found that the sculpture varied from long, slender, flat, finger-like processes to short oval discs, or elongated tear-drop pustules. Most in the juvenile stage have quite small pustules, but even in this they are not consistent. They also vary very much in the spacing of the pustules; mostly they are crowded, as is so well shown in the figures accompanying May and Torr's description, *l.c.*

A comparison of these figures with the figures in Dr. Pilsbry's paper on "Port Jackson Chitons," *l.c.*, will explain the difficulty we have all laboured under in identifying *A.*

coxi, Pilsbry. The description in Pilsbry's paper would do for *lachrymosa*.

In conclusion.—While all previous records of *A. lachrymosa* have been confined to about 150 yards of beach, on Frederick Henry Bay, southern Tasmania, the writer was able some time ago to extend its range to Sulphur Creek, north-western Tasmania; and, more recently, Mr. May has found it on Bruny Island, and now Mr. May and myself are satisfied that it is con-specific with *A. coxi*, Pilsbry. We have the record of two specimens taken by the late Dr. Cox, at Port Hacking, New South Wales, and, finally, Dr. Thiele's specimen extends its range far into the tropics.

Thus a species that has hitherto been considered one of the most restricted in its range is found to have a most extended range north and south, probably greater than any other of our known specimens. It certainly appears very local in its occurrence, the reasons for which must await further elucidation. I have sent two specimens to Dr. Pilsbry, asking him to kindly compare with his type of *A. coxi*, and advise whether he can find any justification for retaining the Tasmanian shell as a sub-species of *A. coxi*, Pilsbry.

NOTE.—Since the foregoing was written I have received Dr. Pilsbry's reply, which is as follows:—"I have carefully compared the specimens of *A. lachrymosa*, May and Torr, with the type of *A. coxi*. I am satisfied that there is no specific difference. A sub-specific difference may be indicated by (1) the difference in colour, my form being pink within, yours greenish; (2) the wider central areas of valves 3-8 in my specimen. This is exaggerated in the figures, which were done on stone by a commercial lithographer from my pencil drawings."

This fully confirms our opinion, and in face of the variability of this species we are hardly justified in making a sub-species of the southern form. *A. lachrymosa*, May and Torr, is therefore a synonym of *A. coxi*, Pilsbry.

The pitting of *CALLOCHITON PLATESSA*, Gould, var. *fossa*, nov.

(Proc. Bost. Soc. N.H., ii., 1846, p. 143.)

Some years ago I noted that one of the shells belonging to this species, that I had collected in Gulf St. Vincent, showed six deep pits, immediately in front of the lateral area of the seventh valve. On January 24, 1920, I collected a second specimen in which the same valve shows a similar number of pits. A few months back, when going through the collection of the Polyplacophora in the South Australian Museum, with a view to determining the species, I noticed a

similar specimen with pitting confined to the same valve; all these were taken in this State. In going through a score of specimens in my own collection from New South Wales, Tasmania, South Australia, Western Australia, and New Zealand, with the exception of one specimen 25 mm. long from Sydney, which is pitted in the seventh valve, all are typical unpitted shells. Mr. W. L. May has sent me for examination three large and handsome specimens from Watson Bay, New South Wales, all of which show similar pitting on the seventh and eighth valves, and the largest one, which is over 40 mm. long, has incipient pitting in the sixth valve as well. In this specimen I counted 12 pits in the seventh valve. These pits commence high on the ridge in the juvenile shell. The pits are deep and only a little longer than broad, in fact very similar to the pits near the ridge of *Rhyssoplax oruktos*, Maughan, but there the likeness ends—they are not as regular in shape nor developed to the same length as in that species. Again, the character of the pitting is quite different from *C. rufus*, Ashby. I have compared it with the type and with the juvenile form from the Bracebridge Wilson collection; the grooving of *rufus* can hardly be termed pitting, but is really longitudinal grooving, and is present to an equal extent in all the valves except the first.

In conclusion.—The existence of these pits and their occurrence consistently on the seventh valve, and in the case of the Watson Bay specimens on the eighth valve as well, suggests a definite tendency to vary in this direction. At first I thought of suggesting that deep-water specimens may have a greater tendency to develop this form of sculpture, and that *C. rufus* (which is only known from dredge specimens) may have been derived from such a pitted race of *C. platessa*. On more careful examination, however, I do not feel justified in advancing such a hypothesis. It will be well worth while for collectors to keep their eyes open for this variant, which may well be known as *Callochiton platessa*, var. *fossa*, Ashby.

SYPHAROCHITON PELLIS-SERPENTIS, Quoy and Gaimard, 1835.

(*Chiton pellis-serpentis*, Quoy and G. Voy, Astrol., ii., 381, pl. 74, f. 17-22; Man. Conch. (1), xiv., 173, pl. 37, f. 14-17; Proc. Mal. Soc., ii., 195, c. *Squamosus*, L. Wissel, Zool. Jahrb., xx., 619, not of Linne (Anatomy); Tate and May, Proc. Linn. Soc. N.S. Wales, 1901, pt. 3, pp. 412-415; May and Torr, P. and Proc. Roy. Soc. Tas., 1912, pp. 38 and 39. Type, Mus. Hist., Paris.)

SYPHAROCHITON SINCLAIRI, Gray, 1843.

(Dief., N. Z'd, ii., 263; Man. Conch. (1), xiv., 174, pl. 36, f. 1-3; Proc. Mal. Soc., ii., 196; Wissel, Zool. Jahrb., xx., 627, pl. 23, f. 38-44, pl. 24, f. 45-48 (Anatomy). Type, Brit. Mus.)

SYPHAROCHITON MAUGEANUS, Iredale and May.

(Proc. Mal. Soc., vol. xii., pts. ii. and iii., p. 114-115, Nov., 1916.)

In October, 1921, Mr. W. L. May, of Tasmania, and the writer jointly examined a fairly large series we had collected in different parts of Tasmania with shells in my collection from New South Wales and New Zealand. My New Zealand specimens were from various localities, but the *S. sinclairi*, Gray, were from Doubtless Bay, collected by Mr. Albert E. Brookes, and from Te Onepote, collected by the late Mr. Suter.

We cannot agree with Iredale and May in separating the Tasmanian shells from the New Zealand ones, or from those from New South Wales. Pilsbry, in his paper on "Port Jackson Chitons" (1894), also states that he "was unable to detect any difference between New South Wales and New Zealand shells." Therefore *S. maugeanus*, Ire. and May, becomes a synonym of *S. pellis-serpentis*, Quoy and Gaimard.

Further, we find that the smooth shells living in company with the more sculptured ones, in Frederick Henry Bay, Tasmania, are con-specific with *S. sinclairi*, Gray, 1843, the New Zealand shells being similar to the Tasmanian ones. In both *S. pellis-serpentis* varies from the somewhat flat highly-sculptured shells so common in Port Jackson, New South Wales, to those that are almost smooth in all areas. We therefore consider that *S. sinclairi* is a smooth variant of *S. pellis-serpentis*, and is certainly common to New Zealand and Tasmania, and, on the authority of the late Dr. Cox, we must conclude, of New South Wales as well, although neither Mr. May nor the writer has seen the smooth variety from New South Wales.

Mr. May sends me the following note in reference to the foregoing:—"I agree with all you have written. The shell varies very much in height, some being very flat, others high and round backed, with all grades between; they also vary greatly in size in different localities. My largest, from Wedge Bay, is 56 mm. long; they may be almost white, black, or of varying patterns of black and white, etc."

In conclusion.—We find that *Sypharochiton pellis-serpentis*, Quoy and Gaimard, is an extremely variable shell in Tasmania, New Zealand, and New South Wales, varying from a highly-sculptured form to an almost smooth one, which must be known as variety *sinclairi*, Gray, the intermediates still living; and Iredale and May's *S. maugeanus* is a synonym of *S. pellis-serpentis*, Quoy and Gaimard.

LORICELLA ANGASI, H. Adams and Angas.

(Proc. Zool. Soc., 1864, p. 193.)

In my paper on the above genus (Trans. Roy. Soc. S. Austr., vol. xliii., 1919, pp. 59-65) reference is made to the "finger-like processes" being noticeable in the anterior portion of the girdle, and the "spear-head spicules" being set opposite them and apparently having some relation thereto. In January, 1920, I collected a very well-preserved specimen at Marino, South Australia, which was free from the usual foreign growth. In this specimen, which is 60 mm. in length, the finger-like processes of the girdle extend right round, and the remarkable "spear-head spicules" are placed opposite these, right round the girdle. In a letter, dated October 17, 1921, Mr. S. Stillman Berry, of Redlands, California, writes me in answer to a letter of mine referring to some remarks that had been made in reference to these strange spicules on *Loricella*:—"I have worked on those *Loricella* and *Kopionella* spicules just enough to know that I want to go into the matter of their structure a great deal more meticulously, which will mean a lot of work in the preparation of slides and so on. I cannot understand how anyone can interpret chiton setae as algae."

DESCRIPTION OF PLATE III.

- Fig. 1a. *Acanthochiton mayi*, Ashby, portion of median valve.
Type.
- „ 1b. „ „ „ median valve. Co-type.
× abt. 13 times.
- „ 2a. „ „ *shirleyi*, Ashby, portion of posterior valve.
Type.
- „ 2b. „ „ „ portion of median valve.
Type.
- „ 2c. „ „ „ median valve. Co-type.
× abt. 11 times.
- „ 3. „ „ *gabrielii*, Ashby, portion of median valves
showing longitudinal striae in dorsal
area. Type.
- „ 4. *Callochiton platessa*, var. *fossa*, Ashby, portion of 7th
valve showing pits.